

The Office Action objects to Figs. 8-14B under MPEP §608.02(g). Figs. 8-14B are corrected by the attached Request For Approval of Drawing Corrections. Withdrawal of the objections to the drawings is respectfully requested. It is submitted the drawings are more directed to explaining the conceptual context and object of the invention.

The Office Action alleges that the title of the invention is not descriptive. The title is amended as suggested in the Office Action.

The Office Action rejects claims 1, 2, 8-10 and 13-18 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,093,583 to Mashino et al. (Mashino). As claim 2 is canceled, the rejection of that claim is moot. Applicants traverse the rejection of claims 1, 8-10 and 13-18.

Applicants assert that Mashino does not disclose a voltage regulator comprising first means for providing a variable threshold level representing a DC component of a phase voltage of one of the phase windings, a comparator for comparing the phase voltage of one of the phase windings with the variable threshold level to provide a pulse signal that is proportional to the rotation speed of the rotor and second means for energizing the field coil when the number of pulses of the pulse signal becomes larger than a predetermined number, as recited in claim 1.

Rather, in Mashino, AC voltage that is induced in the armature winding 10 is peak rectified by the capacitor 139 through the diode 138 to extinguish the charge indication lamp 5 which also indicates the start of supplying the field current (col. 4, lines 20-28 of Mashino). Thus, if leak current flows in the armature winding, the charger lamp may be extinguished by the leak current irrespective of the rotation speed so that the field current is supplied to the field coil.

Furthermore, the Office Action alleges that Mashino discloses a "comparator" as recited in claim 1. However, Mashino only discloses a comparator 912 in Fig. 11 as part of

an oscillation circuit to change the voltage of the junction between the voltage dividing resistors 136A, 136B of the voltage regulator 13' with the lapse of time, thereby supplying a moderate duty signal to the power transistor 131 so that when the generator 1 is not operated the current dissipated in the field winding 12 is suppressed (col. 7, lines 41-55 of Mashino). Thus, Mashino does not disclose a comparator for comparing the phase voltage of one of said phase windings with the variable threshold level to provide a pulse signal that is proportional to a rotation speed of the rotor. Accordingly, Applicants respectfully request the rejection of claims 1, 2, 8-10 and 13-18 under 35 U.S.C. §102(b) be withdrawn.

The Office Action rejects claims 3-7, 11 and 12 under 35 U.S.C. §103(a) as unpatentable over Mashino in view of common knowledge. The rejection is respectfully traversed.

Applicants assert that claims 3-7, 11 and 12 are allowable for at least their dependency on claim 1, for the reasons discussed above as well as for the additional features recited therein.

Additionally, the Office Action does not use a combination of Mashino and other cited references, but rather merely alleges that the features recited in claims 3-7, 11 and 12 are "common knowledge." Applicants respectfully submit that such a statement is conclusory and no support for the statement is provided in the Office Action. Further, proposing to modify Mashino by combining it with "common knowledge" is inconsistent with patent examination procedure. When relying on what is asserted to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. Providing only conclusory statements when dealing with particular combinations of prior art in specific claims cannot support a claim of obviousness. In re Sang Su Lee, Appeal No. 00-1158 (Fed. Circ. January 18, 2002). Accordingly, Applicants submit that the reliance on unsupported per se knowledge does not negate the patentability of the subject matter recited in claims 3-7, 11

and 12. Accordingly, Applicants respectfully request the rejection of claims 3-7, 11 and 12 under 35 U.S.C. §103(a) be withdrawn.

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. It is submitted that the claims as presented herein patentability distinguish over the applied reference and fully meet the requirements of 35 U.S.C. §112. Favorable reconsideration and prompt allowance of claims 1 and 3-18 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,



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Attachment:
Appendix

Date: December 30, 2002

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<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
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APPENDIX

Changes to Title:

The following is a marked-up version of the amended title:

PHASE VOLTAGE CONTROLLED VOLTAGE REGULATOR OF VEHICLE AC
GENERATOR

Changes to Claims:

Claim 2 is canceled.

The following is a marked-up version of the amended claims:

1. (Amended) A voltage regulator of a vehicle AC generator including a rotor having a plurality of magnetic poles, a field coil for polarizing said plurality of magnetic poles, an armature having an armature core with a plurality of phase windings for generating AC voltage under the influence of a rotating magnetic field provided by said rotor and a full-wave rectifier for converting said AC voltage into DC voltage, said voltage regulator comprising:

first means for providing a variable threshold level representing a DC component of ~~means for detecting~~ phase voltage of one of said phase windings, and
a comparator for comparing the phase voltage of said one of said phase windings with the variable threshold level to provide a pulse signal that is proportional to a rotation speed of said rotor, and ~~said phase voltage with a variable threshold level formed from said phase voltage and providing an output signal~~
second means for energizing said field coil when the number of pulses of said pulse signal becomes larger than a predetermined number.

9. (Amended) The voltage regulator of a vehicle AC generator as claimed in claim 8, wherein

said ~~first phase voltage detecting~~ means comprises a first resistor connected between the output terminal of said phase winding and the negative terminal of a vehicle battery, a series circuit of a second resistor having much lower resistance than said first resistor and a switching means connected in parallel with said first resistor, wherein

said switching means is opened if said phase voltage is detected to be higher than a predetermined voltage.

13. (Amended) A voltage regulator of a vehicle AC generator including a rotor having a plurality of magnetic poles and a field coil for polarizing said plurality of magnetic poles, an armature having an armature core with a plurality of phase windings for generating AC voltage under the influence of a rotating magnetic field provided by said rotor and a full-wave rectifier for converting said AC voltage into DC voltage, said voltage regulator comprising:

an input terminal connected to one of said phase windings;

a sub-power circuit, connected to said input terminal, for detecting phase voltage of one of said phase windings and generating a rotation signal ~~if it detects said phase voltage~~;

a main power circuit, connected to said sub-power circuit, for supplying power;

a field current switching element connected to said field coil;

a voltage control circuit, connected to said main power circuit for monitoring the output voltage of said full-wave rectifier and generating a control signal that controls said field current switching element so that said output voltage of said full-wave rectifier can be controlled at a prescribed level; wherein

said sub-power circuit comprises:

a comparator having a first input terminal connected to said input terminal and a second input terminal, ~~and~~ said comparator providing an output pulse signal;

first means, connected to said second input terminal, for providing a variable threshold level representing a DC component of ~~varying with~~ said phase voltage; and

second means for energizing said field coil when the number of pulses of said pulse signal becomes larger than a predetermined number.

14. (Amended) A voltage regulator of a vehicle AC generator including a rotor having a field coil and a plurality of magnetic poles, an armature having a plurality of phase windings and a full-wave rectifier connected to said phase windings, said voltage regulator comprising:

a phase-voltage-input terminal connected to one of said phase windings;

a phase-voltage-detection circuit, connected to said phase voltage input terminal, for detecting phase voltage of said one of said phase windings and generating a rotation signal if it detects said phase voltage;

a field current switching element connected to said field coil;

a voltage control circuit for monitoring the output voltage of said full-wave rectifier and generating a control signal that controls said field current switching element so that said output voltage of said full-wave rectifier can be controlled at a prescribed level; wherein

said phase-voltage-detection circuit comprises:

a comparator having a first input terminal connected to said phase-voltage-input terminal and a second input terminal, ~~and~~ said comparator providing an output pulse signal

a threshold circuit, connected to said second input terminal, for providing a variable threshold level representing a DC component of ~~varying with~~ said phase voltage, and

means for energizing said field coil when the number of pulses of said pulse
signal becomes larger than a predetermined number.